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## Abstract

A Measure of Light: Research into images of the sacred in cast and fused glass. A study taking the form of an exhibition of sculptures and architectural glass exhibited at the Canberra School of Art Gallery from March 4 to 12, 2004 which comprises the outcome of the Studio Practice component, together with the Report which documents the nature of the course of study undertaken.



## Acknowledgements

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I would also like to thank Nick Stranks, the Technical Assistant for the Sculpture Workshop, for allowing me the opportunity to experience the process of casting some of my pieces in bronze.

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## Introduction

*"The measure of the reality of a thing is the measure of its light."*

Thomas Aquinas

Commentary 1 Timothy, vi 4

Louis I. Kahn, the American architect, once had a famous conversation with a brick. He asked "What do you want, brick?" and naturally enough brick responded with "I like an arch"<sup>1</sup>. We can have the same conversation with glass, asking it "What do you want, glass?" and I think it would reply "I want to be between the viewer and the light." Glass has an intimate relationship to the light. As a material it has an amazing range of faces — it can be opaque and solid to the light. It can be translucent and coloured, existing in that realm that Goethe described where light and darkness meet in colour. It can be transparent, having form in space yet being open to the light.

Coming from an architectural background my preoccupation is often with geometry and form, and in this instance, their interaction with the material qualities and opportunities of glass — opacity, transparency, colour and molten plasticity. I also recognize as a distant goal that the true position of glass is when it takes its place between the viewer and the light.

My final works for this year draw on all these qualities of glass. I am producing a series of sculptural pieces and have also been asked to design a window for a local church. Both of these projects hope to use the relationship of glass to light, and both of them hope to do so as a way of expressing the sacred.

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<sup>1</sup> Lobell, J., Between Silence and Light, Boston, Shambhala Publications Inc., 1985, p40.

As this was my first full-time year in the glass workshop I will not be presenting a technical section, as I spent the year gaining knowledge that forms the current culture of the workshop, rather than extending it with new techniques.

In the body of the report I will cover my previous experiences and the influences I work out of, followed by an overview of the year, showing a chronology of my experiments and experiences with glass, and the concurrent development of my ideas. I will also reflect upon my working processes and methods. The second section will deal with the final works, divided up into the individual bodies of work.

## Notes on the Artist

Before coming to the Glass Workshop, I had two previous trainings that place me more in the realm of the designer than the artist. Recently I completed a Diploma of Visual Arts in the Wood Workshop at the National Institute of the Arts, focusing on furniture design, while previous to this I studied Architecture at the University of Sydney.

One of the encumbrances of my architectural training was the strong admonishment to never give the self or personal as a reason for a design decision. One always pointed to the brief, the site, the climate, the materials or the design intention. It was a fatal mistake to begin any explanatory sentence with “I wanted”. Much of the research of this year was therefore given to the process of uncovering and articulating those ideas that inform and drive my artwork.

There is much in my work that often points back to my training in architecture, which has also carried into my design of furniture. Sometimes an architectonic aesthetic of the grid or line is often apparent, which grows out of the experience of hand drafting. There is a focus and concern for geometry, proportion, order and detailing. Detailing shows the integrity of the meeting of the individual pieces which make up the whole, and also the designer's intention of how the human being meets the work visually and in a tactile sense. Consistent detailing brings integrity to the design. The object is evaluated from a formalist perspective as a composition of line, graphic, volume and void. Included in this education are all the tacit experiences of drafting and model making that inform the hands and the eye.

As architectural practice is the bringing of order and harmony into the human environment, my interest has always extended itself towards the forms, order and harmony of the natural world. The desire to understand the ordering force of nature lead to my interest and engagement with the scientific works of Johann Wolfgang von Goethe,

particularly his *Theory of the Metamorphosis of Plants*. The possibility inherent in Goethe's method is a style of participatory consciousness, such that one experiences the formative forces of Nature rather than standing over and against the finished objects of Nature.

The basis of Goethe's cognitive method is to live into the phenomena, to live into those aspects of the phenomena which are often described as secondary — the colour, the form, the taste, the smell, that is to say the qualitative aspects of the phenomena, (the primary qualities are those that can be given quantity and measure). It is the artistic faculties that are brought into this process of cognition. In this way Goethe was able to study natural forms in their becoming. In his work on the metamorphosis of plants he realized that all is “leaf”. Between the differing and separate outward forms of leaf, flower, fruit and seed Goethe saw a mobile ideal unity, an archetypal plant form that expressed itself through a sequence of formative transformations. This process of organic transformation is called metamorphosis. Goethe produced similar work on the comparative anatomy of mammalian skeletons. The notion of “arising”, that form comes out of movement, or that even seemingly static phenomena come out of a dynamic situation also penetrated his colour theory. For Goethe colour was not static or pre-existing but arose out of the various interactions of light and darkness.

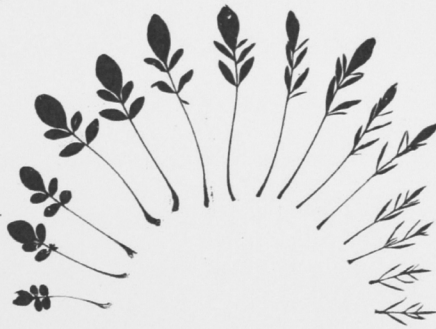


Fig (1)



My own involvement with the Goethean study of plants and bones informs my looking, my sense of surface and form, and thereby my artistic work. The experiences of the formative movements between the finished forms of nature, be it a sequence of plant leaves (Fig.1) or the vertebrae of the spine, lives in the background of all my artistic explorations of form. To be honest it is often at odds with the finished geometry of my architectural heritage, but it exists there as a strong influence nonetheless.

The generating background behind both of these interests is a spiritual worldview that is again focused on these great themes of order and harmony. The qualities of order and harmony can only exist in the context of a pre-existing relationship, and the fundamental spiritual relationship is between the self as microcosm and the world as macrocosm. The world is here experienced as the manifestation or revelation of the spirit. The question here is how do we participate in this relationship? Goethean science offers a way of participating cognitively in the world process. Through my art I have hopefully found ways of producing images of this relationship.



## Evolution of Works

My interest with glass centres around its relationship to light. With light comes colour and tone. As someone who works with glass through casting and fusing, this relationship of glass to the light holds potential in two distinct areas of working. On the one hand there is the realm of fused architectural glass, where the glass mediates as a coloured veil between the viewer and the light. On the other hand there are those mysterious and often unpredictable interactions of glass, light and form, which occur in cast sculptural pieces.



Fig.2

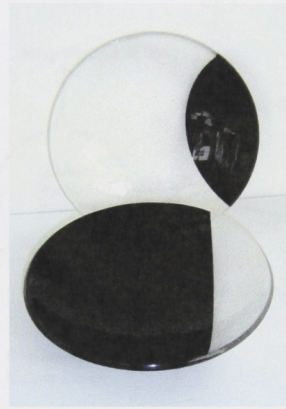
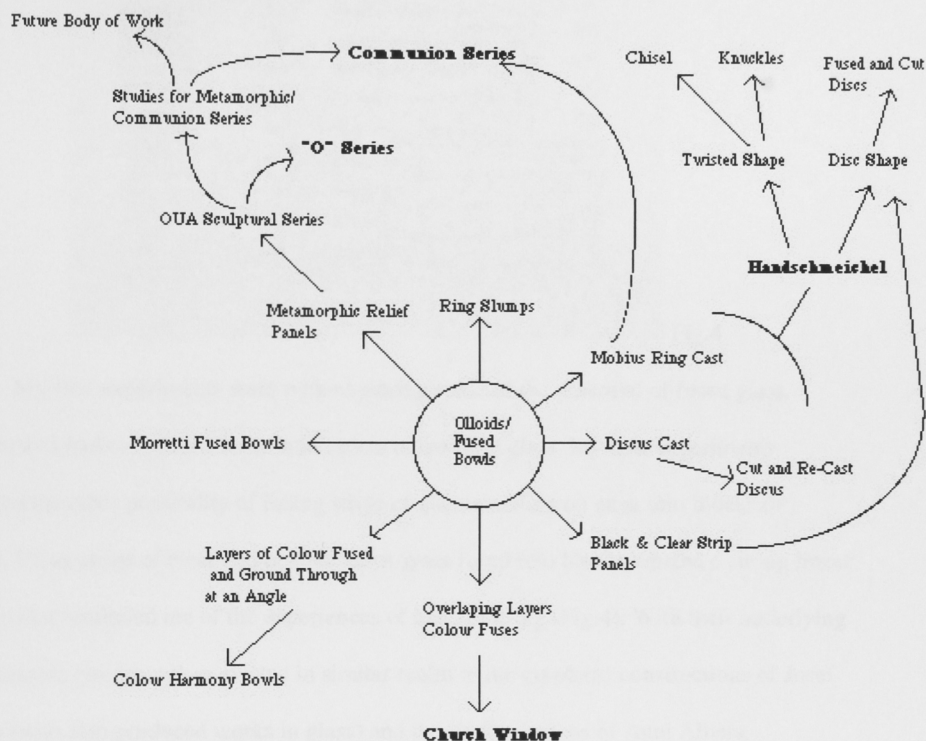


Fig.3

My previous experiences with glass were of casting a small sculptural piece, the *Olloid* (Fig.2), and of fusing up a series of slumped bowls based on the graphical division of the circle (Fig.3). I began this year with many questions about other ways of joining and working with glass, and the desire to explore vessels and lighting. I was given the freedom to explore these questions through tests and experimental pieces. Accordingly much of my early work was driven by process orientated “What happens if...” questions. Through the process of writing an Independent Work Proposal I also questioned what it was I wanted to make, and why I wanted to make it.



Evolution of Works Flow Diagram

The diagram entitled “Evolution of Works” shows how these early experiments flowered out into different directions, which led eventually to the final pieces. The early experiments were all explorations of different kiln working techniques — fusing, slumping and casting.

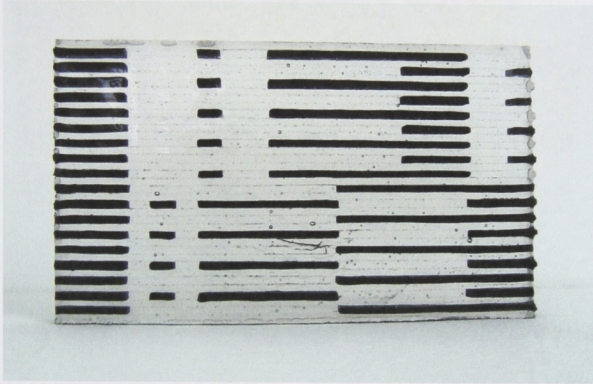


Fig.4

My first experiments were with exploring some of the potential of fused glass. Previously I had only fused horizontal sheets of overlaid glass. My first experiments explored the other possibility of fusing strips of glass standing on edge into blocks or panels. Using strips of clear and opaque black glass fused into blocks created a strong linear graphic that reminded me of the experiences of hand drafting (Fig.4). With their underlying architectonic construct they existed in similar realm to the graphical constructions of Josef Albers (who also produced works in glass) and the textile designs of Anni Albers.

I was also very interested in the overlay of differently coloured glass sheet to create mid-tones and hues. I made some experiments with fusing layers of differently coloured glass sheet, such as red and blue, then grinding back through the different layers at an angle to alter the thickness and therefore produce a graduation of colour. I also composed small panels of strips of overlaid glass to explore, firstly the creation of colours and tones by the overlapping pieces, and secondly to explore the idea of composing layers within the depth of a block of glass (Fig.5).



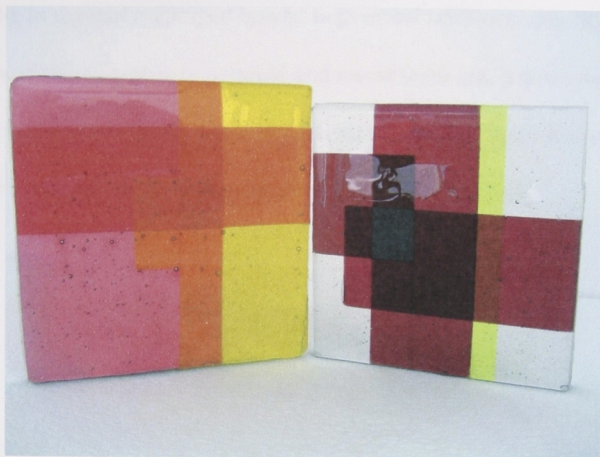


Fig.5

I was very much taken with early historic examples of fused mosaic glass, and as a part of these experiments created some bowls using a traditional technique of carefully laying short sections of glass rod into the concave part of a two-part press mould. The weighted mould, when brought up to fusing temperature, pushes all the pieces of rod together and presses them into the bowl form. The fused bowl forms could then be refined, by grinding and shaping the lip, using the glass engraver. This was my first experience of shaping curves by grinding, which would prove useful later on.

I also made some experiments with slumping rings of clear sheet glass over different formers. As a piece of research this was more an exploration into form, how one simple form, the flat ring, could be deformed into different shapes. It is probably a good illustration of my style of thinking and exploration, to take something simple and then push it in different directions and variations.

In a different direction my early casting and sculptural explorations were based around the appeal of circular forms — the Moebius ring, a twisted continuous surface, and the discus form. The discus was an exploration into a form that had a variation in thickness from its edge to its middle and the effect this would have on colour density and tone. Following on from the idea of the graphical division of a circle, which I had achieved

through fusing in my early slumped bowls, I cut up two different discus casts and then reinvested the matched pieces in a mould and recast them into a new whole discus. This was another experimental process, fusing precast pieces, one that I was not sure would work, but did in the end achieve results (Fig.6).

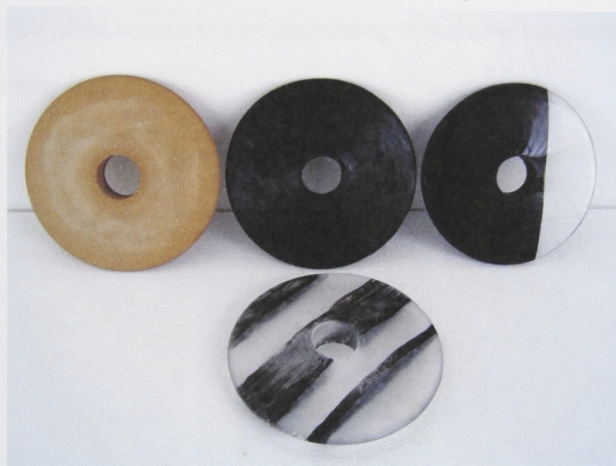


Fig.6

These early experiments gave me an invaluable ground of experiences from which to work out of. Even a casting mould that failed increased my understanding of the process and how to better my technique the next time. Though the individual results were quite small test pieces they often did contribute directly to the final works.

During this experimental period I was also questioning myself about the ideas behind my work, particularly the prevalence of the circle as a design motif. I explored my associations with the circle and found that I often used it as a carrier for spiritual meaning. My training in architecture had exposed me to its symbolic use in building plans and mandalas as an image of the spiritual world or the more eternal or transcendental aspects of our experiences. These reflections began an investigation into a body of work with the explicitly spiritual theme of communion or devotion. I had also wished to combine this theme with the idea of metamorphosis, an idea I had been studying through Goethe's



scientific works. The principle of metamorphosis describes how a sequence of distinct sense perceptible forms, such as the successive organ forms of a plant — leaf, sepal, petal, stamen, fruit, seed — are experienced as being related through a mobile ideal form of which they are transformations. Particularly in the metamorphosis of a leaf sequence one learns to participate in the sculptural movement acting between the individual but sequential leaf forms (Fig.1).



Fig.7

I explored the idea of metamorphosis firstly through a series of three cast relief panels. These panels showed a purely form based transformation, again using a circular motif. The visible form in each panel is the result of two teardrop areas of invisible force as they move around the edges of a containing circle, altering the distribution of matter as they move (Fig.7). Like a leaf sequence each panel is a step in the flow of this movement of force. Modelled first in clay, as translations of a sculptural relief into glass, I felt they were not very successful. The form of the pieces, so apparent in the clay originals, dissolved through the translucency of the glass

I moved onto a sequence of three forms that were free standing sculptural pieces. They had the theme of a metamorphosis of the experience of communion. There was a metamorphosis of content, as each form represented a different type of experience of communion, and also of form, as each form was a transformation of the previous form. I

named this sequence of forms the “OUA” series after the vowel sounds and their corresponding gestures from the art of Eurythmy. In Eurythmy, where the formative gesture of sound is expressed through the movement of the body, the vowel sounds are felt to express something of the soul, “O” is an enclosing oneness, “U” has an “I to Thou” directionality, while “A” expresses adoration or praise (Fig.8).

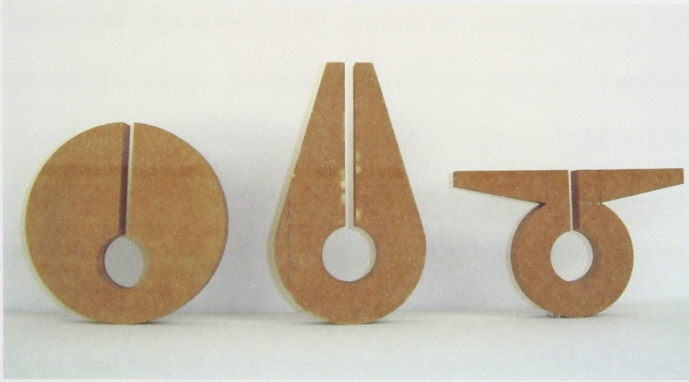


Fig.8

To express the idea of the “light shining in the darkness” of spiritual communion, I wanted to explore the effects of glass thickness on colour to add tonal emphasis to the forms. From basic MDF models I made moulds to produce multiple waxes. By altering the thickness of the wax I could therefore affect the tonality of the same form to add tonal emphasis in different ways (Fig.9). In a sculptural sense these forms were very two-dimensional and never seem to have overcome their MDF beginnings.

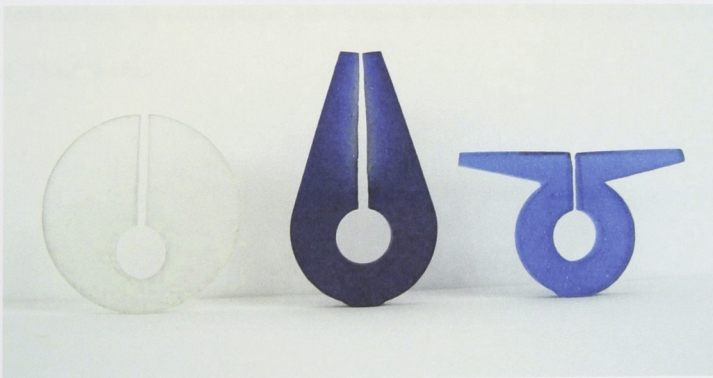


Fig.9



At this point I was exploring another series based purely around the idea of metamorphosis of form, the “O” series. These were much more organic and three-dimensional. I cast blocks of wax that were then shaped and carved by hand into the desired form. They had the three-dimensional quality of form that I had desired for the “OUA” series. The “O” series is covered more fully in the chapter on final works.

I explored the idea of the “OUA” series further through drawing. The original MDF models had remained strongly geometric, with an extruded industrial aesthetic. Through the drawings I explored a more literally organic aesthetic, trying to bring the lyric movement-between-forms that is experienced in a plant leaf sequence into the work. There were two strong ideas at work, the themes of communion and metamorphosis, but I was not convinced they were working successfully together.

For the final body of work I decided to put the idea of a literal organic form transformation aside, and instead focus on a series of pieces around the same theme of communion, a metamorphosis of content rather than of form. These final works continued to use the circle as an image for expressing spiritual experience — the relationship between the self and the world, or the dynamic interaction between spiritualization and materialization. The forms of these pieces were derived from earlier explorations with the “OUA” series and the small Moebius ring. A full description of these forms, and the concurrent design of a commission for a church window is to be found in the section entitled “Final Works”.

## Process and Method

Based, I think, on my previous training in architecture and furniture making, I tended to work through my process by drawing and model making. In the beginning I documented a lot of my ideas through black and white ink drawings, and explored forms through scaled down plasticine models, and later plaster or wax models. In the practice of architecture one can never present the final piece to the client, but must always seek to communicate the idea or intention of the finished work through surrogate means, such as graphical communication or scaled models. The benefits of this are that it trains you to think three-dimensionally about objects that do not yet exist, and also to think sequentially about the process of their construction through time, the sequence of their making. The danger in an art context is of course that communicating the idea replaces making the idea into a reality. Sometimes my artistic process involved the necessity of overcoming the strengths of my previous training.

The process often involved not finding new ideas, but learning to identify and articulate the ideas that were already informing my work. Having previously studied architecture, and travelled, worked and studied overseas, I had already been exposed to and absorbed many ideas from various sources. It was often not a matter of looking out for new influences, but of identifying the sources of motivating ideas that had been accrued over a ten year period.



Fig.10

Moving from drawing to sculpting full-scale prototypes in wax brought a necessary dialogue between the intention and the actual object into the process (Fig. 10). The dilemma with working with kiln formed glass, either cast or fused, is that there is still a distance between the artist and the material — at its most malleable it is least accessible, beyond reach in the 870 degree kiln. Yet this distance is also what creates a degree of control of the material for the artist — glass sheet for fusing can be cut accurately when cold, cast glass is based on wax forms that may have taken weeks to sculpt. I often found I was approaching the glass with a woodworker's head, but needless to say, my background in architecture and wood meant that the processes particular to kiln formed glass suited me.

The full-scale wax models are still a surrogate expression of the idea. The wax as an opaque material cannot model or imitate the effects of light in the final glass form. Often the wax had its own seductive aesthetic, which could be hard to leave behind. From these wax prototypes I made plaster mother moulds, partly as a way of preserving all the time and energy that had gone into the modelling, and partly as a way of easing the lost wax casting process. It is much easier to steam out a thin-skinned wax slip cast of a form from a casting mould than a solid wax original.

As a further development of this process I have considered replacing the wax modelling with some other process or medium. The wax prototype was often only an inaccurate hand sculpted version of a complicated geometric form. It was difficult to get the smooth continuous surface required by these forms. To remedy this I sometimes went back to the surface of the mother mould to smooth and rework it. I have considered using my skills in woodwork to make the prototypes in wood, or to translate the forms into a digital image and work with rapid prototyping technologies. As wax is an opaque material, while the glass is translucent, it was not always possible to accurately sculpt the interior surfaces of the form, invisible in the wax model but open to view in the glass cast. It is also true that

given the length of the process and the number of steps between accurate prototype and finished casting, i.e. distortion in the slip cast waxes, mould movement during firing, cold working and surface grinding, it is possible that the concept of accuracy of form is ultimately not a beneficial value to hold on to.

It is only towards the end of this process that an object in glass came into existence. Then began the long process for refining the cast through cold working the surface to the desired finish. The acquisition of adequate cold working skills became a major hurdle in the second half of the year. Firstly gaining knowledge about what technologies were available and acquiring them, and then secondly finding ways of bringing the technology to the surface of the cast objects. As the forms of my sculptural pieces are not simple planes many of the machines in the cold workshop had only a limited access to the surfaces for cold working and polishing. In this regard Richard Whitely, the head of workshop, was a great help in directing me towards appropriate solutions for cold working these difficult forms.





## Communion Series

These works embody aspects of the experience of spiritual communion, that sense of oneness between the spirit inside us and the spirit in the world. Imagined as altarpieces they are to be a representation of the relationship between the microcosm of the little self and all round surrounding of the macrocosm. The circle with its polarity of encircling periphery and point centre is the intuitive symbol of this relationship, and became the starting form for this sculptural series. In a real sense as a point-centred bodily being we experience ourselves literally at the centre of our world looking out into the surrounding sphere of our experiences. The horizon encircles us, while the sky enspheres us. We intuit the relationship between the self and the world in the image of the circle.

The realm of projective geometry offers a useful image for understanding the relationship between the separate individual beings of the world and the unifying spirit. Within the space of the projective universe all separate measurable circles with their point centres stand in the same relationship to the ideal circle at infinity. Though spread out through space, the centre of each individual circle is identical with the centre of the infinitely large circle at infinity. Though appearing as a multiplicity of circles, from the standpoint of the infinite, they have a unified identity. Yann Martel in his Man Booker prize-winning novel *The Life of Pi* describes this experience in this way –

“ One such time I left town and on my way back, at a point where the land was high and I could see the sea to my left and down the road a long ways, I suddenly felt I was in heaven. The spot was no different from when I had passed it not long before, but my way of seeing it had changed. The feeling, a paradoxical mix of pulsing energy and profound peace, was intense and blissful. Whereas before the road, the sea, the trees, the air, the sun all spoke differently to me, now they spoke one language of unity. Tree took account of

road, which was aware of air, which was mindful of sea, which shared things with sun. Every element lived in harmonious relation with its neighbour, and all was kith and kin. I knelt a mortal; I arose an immortal. I felt like the centre of a small circle coinciding with the centre of a much larger one. Atman met Allah.”<sup>2</sup>

There is a strong tradition of the circle carrying spiritual meaning, whether it is in the mandala, which represents a map of the transcendental layers of the world, or when it appears as the aureole or halo surrounding images of deities or enlightened beings, to represent the body of enlightened awareness. In that context it represents an encompassing consciousness centred on the heart or mind.

This geometric image of the self and the experience of spiritual communion occurs also in the Christian mystical writings of Angelus Silesius (Johannes Scheffer 1624–1677), as these couplets from *The Cherubinic Wanderer* show:

*Gott ist mein Mittelpunkt, wenn ich ihn in mich schließe,  
Mein Umkreis dann, wenn ich aus lieb in ihn zerfließe.*  
(God is my middle point, when I enclose Him into myself,  
My circumference then, when out of love I dissolve into Him.)

---

*Ich weiß nicht was ich bin, ich bin nicht was ich weiß:  
Ein Ding und nicht ein Ding; ein Stüpfchen und ein Kreis.*  
(I know not what I am, I am not what I know:  
A thing and not a thing; a tiny point and a circle.)

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<sup>2</sup> Martel, Y. *The Life of Pi*, Edinburgh, Cannongate Books, 2002, p.62.



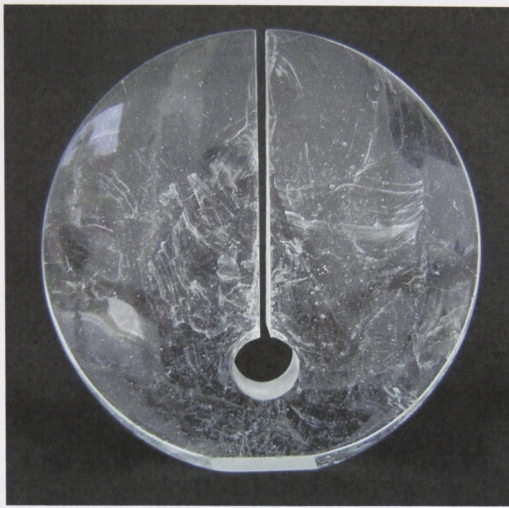


Fig.11

Looking back at my own artwork I have often used the circle as a compositional device and as a way of indicating layers of an encompassing reality. In these sculptural works I wish it to retain the same meanings, but particularly with the two smaller pieces to move into a more dynamic experience — from circle to circulation. The larger work, entitled *I In Thou* (Fig.11), uses the circle as the embodiment of the All, the perfection of the eternal. The small circular void is the self, connected by that pollination channel of the devotional gesture of the soul towards the divine, the look of “Thou” that the soul makes towards that which is greater. The other two works use a more dynamic version of the circle, representative of the dynamic interaction of time and eternity.



Fig.12

This piece, due to its large size, was created using a large open face mould (Fig.12). A former of high-density foam was sculpted into the shape of one side of the piece and a mould built around it. The former was angled in the mould to try to use the least amount of glass possible to cast the form, as the second face would have to be shaped by grinding glass away after casting. As the open-faced mould is charged with glass while lying in the kiln, I was able to use my choice and position of glass pieces to try and control the effects of internal veiling that would occur when casting the piece. To this end I laid larger pieces of casting billet towards the top end of the form and graduated the size of pieces down towards the bottom end of the form where I wanted the veiling to be more intense.

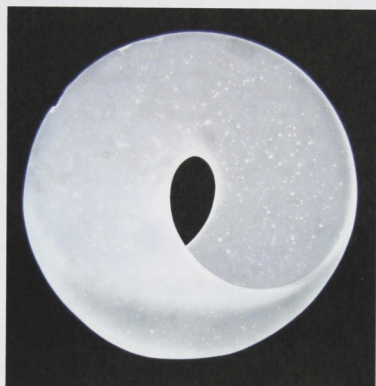


Fig.13



Fig.14

In the works entitled *Cycles of Time* (Fig.13) and *Eternal Return* (Fig.14) I have used the Moebius strip, with its twisted lemniscatory surface as a dynamic image of the interaction between self and world or time and eternity. Living into the surface and the line of the edge of the form produces an experience of cycling through expansion and contraction. There is an outward peripheral journey of rarefaction that then moves into the centre with contraction and manifestation. The unfolding of time is experienced as a rhythmic process of expansion and contraction, a cyclic process of incarnation and then excarnation, the breath of the Wheel of Life. In alchemy there is a similar picture in the



alchemic process of circulation or rotation, where a preparation is hermetically sealed in a vessel and allowed to pass through a rhythmic process of warming, evaporation and expansion, followed by a period of cooling and condensation. The purpose of this process is an exaltation of the essence of the medicine, to raise it to a higher state.<sup>3</sup> In the same sense we could see the cycling of the soul through incarnation and excarnation as a similar process aimed at eventual spiritual exaltation. This piece has a relationship to the image of the Ensō of Zen art and calligraphy (Fig.15 and Fig.16) or the Ouroboros of the Western Hermetic tradition (Fig.17).



Fig.(15)



Fig.(16)



Fig.(17)

The form for these pieces was modelled in a full-scale wax prototype. From this I made a two part silicon rubber mother mould. The mother mould proved to be ridiculously large and difficult to handle, but I managed to produce slip cast wax casting positives from it. These casting waxes were fully invested in mould material, producing a large and barely manageable closed casting mould (Fig.18 and Fig.19). *Cycles of Time* is cast in clear Blackwood casting crystal, while *Eternal Return* is cast using scraps of brown Bullseye sheet glass. The Bullseye is unfortunately prone to suckers (indentations in the cast due to the contraction of the glass on cooling, especially where there is a large difference in thickness), and my cast did not escape the process without a few of these.

<sup>3</sup> Junis, M., Practical Handbook of Plant Alchemy, New York, Inner Traditions, 1985,p165.



Fig.18



Fig.19

The clean up of the casts also necessitated learning new cold working skills that could cope with this scale of object. The transparency of the material also highlighted deficiencies in the sculpting of the wax prototype, particularly the line of the internal surface, not visible in the opaque wax, but now painfully obvious in the transparent glass. I have tried to adjust this discrepancy during the cold working process.

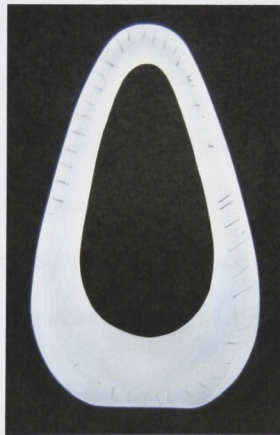


Fig.20

The third piece, *Incarnation* (Fig.20), uses an attenuated circle to give an impression of the cycle of descent into matter and the reascent into a more rarefied state. The perfect form of the circle has been altered by the two polarities of materialization and



subsequent rarefaction. The curved belly of the piece makes reference to the serpentine circle of the Ouroboros.



Fig.21

This piece was cast horizontally in a large bathtub shaped mould that was halfway between an open face mould and a closed mould (Fig.21). The major technical issue was the contraction of the cast ring of glass as it cooled around the plaster core, and the danger of it cracking if the core did not give way. The core was therefore made with a mix of plaster, silica and paper pulp. The paper pulp burns away while firing the mould, leaving voids in the plaster that can give way as the glass contracts. This strategy worked, and the piece came out whole.

The three forms of these pieces have different sculptural and aesthetic qualities. *I In Thou* is monumental with a dominant plane in which it exists. *Cycles of Time* and *Eternal Return* are more approachable and three-dimensional. *Incarnation* stands somewhere between the two. The works are meant to exist independently of each other, while having a similar theme.

## “O” Series



Fig.22

Much of the time I have spent overseas has been involved with the study of Goethe's scientific impulse, particularly his theory of metamorphosis. Through the idea of metamorphosis Goethe points to a way of looking at different forms, particularly organic forms, as being related by a mobile ideal content. Through the “O” Series (Fig.22), a sculptural trio, I explored a simplified expression of the idea of metamorphosis. The organic nature of the forms was also informed by my study of plant and bone forms, particularly the developed sculptural sensitivity towards the curves and surfaces of these forms.

Appropriately the “O” Series arose out of my investigations while modelling the twisted surface of the Moebius strip in plasticine. The twisted surface is often found in organic forms, especially bones. One of these plasticine models had an interesting reflection of solid and void between the front and the back, in the same way that the curve of an “S” is convex to one side while being concave towards the other side. A hole that penetrated and linked the hollows created a continuous surface through the middle of the piece. I was reminded of Marc Newson's use of the continuous surface in his *Event Horizon* furniture. There was much that was of sculptural interest in this piece, but the

constant question when modelling in opaque materials is “How will this translate into glass?”

I continued the investigation with a larger plaster model, trying to recapture some of what I had seen in the smaller plasticine model. I paid attention to the curve of the surfaces, wanting to get the same dynamic curvature found in organic forms, like the cupped hollow of a petal. A wax prototype was the next step, basically a full-scale model (See Fig.10 for a sequence of models). This first form seemed like a good beginning, it was compact and contained, but had the potential to be changed. The second form was a transformation of the first by stretching it out into the horizontal direction, the sculptural task was to find how the sense of the ideal form finds its balance in these new conditions. The third form reaches up into the vertical, but is at the same time more embryonic. It is on the way to revealing its full form.



Fig.23

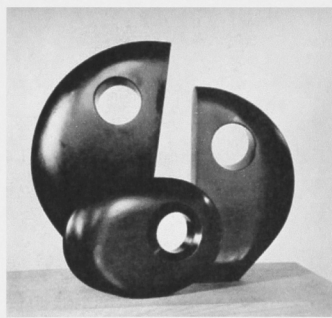


Fig.24

These forms reminded many people of the work of Henry Moore and Barbara Hepworth. Both of these artists took their inspiration from organic forms, and the attitude that something inward was revealing itself through the sculptural form. I investigated the work of Barbara Hepworth (Fig.23 and Fig.24) and found that she had also produced sculptural trios in stone. The trios were often quite abstract forms, almost rounded mini-megaliths. Some of them had a similar aesthetic of a penetrated volume. Their impact was



it their arrangement, the relationship of the three forms and the space between them. I felt what I was attempting was different in that my three sculptures had an ideal relation of form, rather than a spatial relationship of composition. Also I was attempting to bring the effects of the interaction of light and form into play that comes with glass sculpture.

I cast these forms in clear and blue glass to explore the interaction of form, glass and light. It is very hard to predict the lens-like effects of glass. A lens can create highlights along edges, but it can also diffuse light and create an area of relative darkness. With a transparent object there is also the effect of the surface becoming a window onto the interior. The cast blue glass shows the effects of the interaction of glass thickness and colour density. As the thickness of the form tapers away, so the colour of the piece lightens, with highlights appearing towards the thinner edges.

## Handschmeichel

Through the process of modelling the prototypes for the sculptural pieces I realized that there was a certain attraction and value in these smaller scaled pieces themselves. Having been modelled by hand they suited the hand and the space between the hands. Rather than the overtly visual qualities of a glass object they had potentially a more tactile beauty, to be experienced while holding them. I remember that my elder brother had a glossy black rainforest seed that he had picked up in his travels. He always had it in his hands while studying — it became a kind of worry bead or talisman. The sculptural piece that I had cast last year, the *Olloid* (Fig.2), was described by people as being enjoyable to hold. A friend, feeling how the twisted surface fit neatly into his hand, called it “the first tool”. Handschmeichel is a German word used to describe these objects that we like to hold, and I have used it to title this particular body of work.

This concern for the experiences of the hand arises out of my training as a designer, firstly in architecture and then in furniture design. As a designer/maker one accrues all those personal experiences of the hand involved in the activities of drawing, drafting and model making. There is a sensitivity developed towards the fine movements of the hand, the difference between the holding of a pencil or a knife, the relationship between hand pressure and the weight of a pencil line. On another level, besides all the tacit experiences of the hand in act of designing, there is also the designer’s consideration of “How will people meet this object?” This is a concern for the visual aesthetics of an object, but also for its tactile experience — how is a handle detailed, or the edge of a table, how does the hand of the user meet and open a drawer.

I have had a continuous attraction to the forms underlying this series, that is, the twisted surface, the twisted ring or Moebius strip and the flattened sphere of the disc.

The *Olloid* is an example of the twisted surface, at its foundation is a pair of equally sized circles that lie on perpendicular planes, where the centre of one circle sits on the circumference of the other. The surface is generated as these two circles roll over a flat plane. Because the two circles exist in perpendicular planes to each other, the surface between them twists from one orientation to the other creating an object, which at the right scale, fits the grip of the hand.

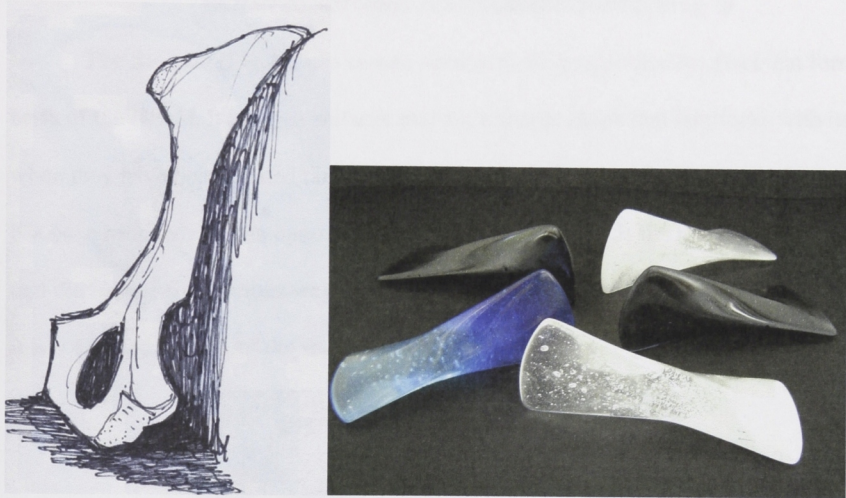


Fig.25

The *Chisel* was a development of this form (Fig.25). The circles are replaced with isosceles triangles, and the shape lengthened. This kind of twisted surface is often found in bone forms. The bone forms being the calcifications of the stress lines of motions of the body. I have a sheep's pelvis where one particular part of the surface is developed by this intriguing twist, which I wished to isolate. As I modelled the form and it developed a relationship to the gripping space of my hand there arose all those connections to the countless forms of tools that have been similarly shaped by their relationship to the hand — axe heads, chisels, adze heads and handles. The form is slightly ambiguous — is it a bone or is it a tool? Maybe it shows the relationship between the forms the hand generates outwardly as tools, and the forms generated inwardly as bones.





Fig.26

The *Knuckle* (Fig.26) is a simple version of the perpendicular offset that forms the basis of the *Olloid*. It has two surfaces that are a simple shape that interlocks with itself when they have been rotated ninety degrees. One can also think of it as a tetrahedron that has been rounded over on opposite and perpendicular edges. It fits in the palm of your hand and the fingers find various ways of interacting with the form. Less organic than the *Chisel* it is a distilled version of the same geometric principles.



Fig.27

These forms, with the *Moebius Rings* (Fig.27), were all cast in closed moulds. I experimented with the control of the internal colouration of these pieces by adjusting the way the moulds were charged. The two clear *Chisel* forms are cast Bullseye frit. I was able to lay graduations of frit size into the mould to control the layering of bubbles in the pieces. With two of the other *Chisel* forms I adjusted the positioning of differently coloured

Bullseye sheet glass in the casting reservoir. This was based on conversations had with Helen Stokes, a visiting artist at the glass summer school of 2003. Thanks to Nick Stranks, the Technical Assistant for the Sculpture Workshop, I was able to cast some of these same pieces in bronze, and explore the effects of a new material on these forms.



Fig.28

The other forms in this body of work, the *Discs* (Fig.28), are related to the flattened sphere — they are like seed forms to be cupped in the palm of your hand. There was also an intention, based on comments made during one of my workshop critiques, to link together my explorations into fused panels with the cast sculptural works. These forms all began as square fused blocks of Bullseye sheet glass. The graphical quality of these blocks relates directly to some of my first experiments in fusing from the beginning of the year (Fig.4). Fusing up blocks of sheet glass allowed me to control the design of the interior of the glass block in ways that casting could never do. I was able to keep a strong internal visual graphic, with sharp lines and shapes. Then followed a process of shaping the fused blocks, firstly into round puck-like billets using a jig I had made for grinding circles on the linisher (Fig.29). I then faceted the edges of the round billets by grinding progressive tangents to form the curved edge of the flattened sphere.





Fig.29

As a group the Handschmeichel series appears as quite a diverse collection of objects, some colourful and polished, others black or clear and brought to a soft matt finish. Hopefully they all invoke the desire to pick them up and to hold them - that they become known to the hand as well as to the eye.

## Church Window



Fig.30

In the past I have produced leaded glass windows but I have always been disappointed by the process for two reasons. Firstly the existence of the leading, which it can be argued has a valid existence and place, holding the glass pieces together while also creating the necessary dark contrast to the bright glass colours. Still, it annoyed me. Secondly, the frustration of being limited by the palette of colours available from the supplier. Often when cutting the glass on a light table, I was more taken by the layers of overlapping colour of the illumined glass in the transparent scrap container than by the piece I was actually making. It was probably these two experiences which pushed me towards investigating working with kiln formed glass.

As can be seen from the previous discussions in the chapter entitled Evolution of Works, many of my early experiments were focused on the possibilities inherent in fused glass. These were either in the direction of overlaying colours or the creation of graphics within panels that could be used in an architectural setting. The fused glass panels of Dorothy Hafner (Fig. 31) were pointing in the direction that I wanted to travel.



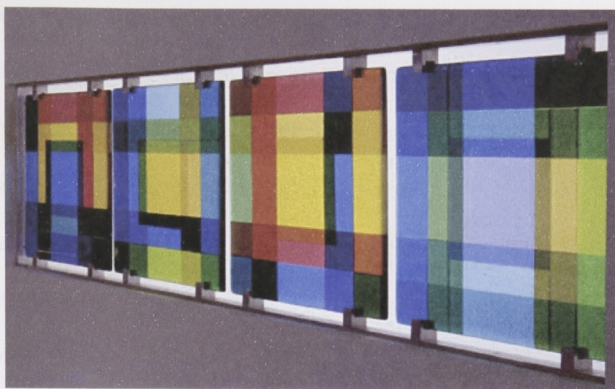


Fig.31

With this in mind it is fortunate that, with an impulse from the Rev. Cheryl Nekvapil, a priest of the Christian Community, we developed the idea of a commission for a religious window to be included in the research proposal for my Masters of Visual Arts. The Christian Community was founded in Germany in the early 20<sup>th</sup> Century, and works out of a renewed sacrament, The Act of Consecration of Man, that speaks to the consciousness of the modern individual. Though not identifying with the usual definition of a Christian, I attend the church, and find that the language of the ritual presents strong religious images. As my sculptural pieces have a spiritual theme, it was exciting that I could explore a similarly spiritual theme through a fused glass window.

The Christian Community have a small chapel in Hackett. The window commission is part of a gradual process of the upgrading of their chapel. The building is a former Guides hall of the type that is often found on the edges of parks and ovals throughout Canberra. The chapel is basically a large rectangular room of concrete block with a high flat ceiling and a series of horizontal rectangular clerestory windows. The toilets, kitchen and vestry are located at one end, leaving the remaining space for the chapel. Though the community would prefer a more organic style, this building speaks a language of the rectilinear and the orthogonal (even the floor was covered in a chessboard pattern of light

and dark squares). Though not the soaring heights of Gothic architecture, there are still precedents for the use of this orthogonal language for temple or church architecture, from Solomon's Temple in the Old Testament through to Frank Lloyd Wright's Unity Church, with its composition of rectangular, flat roofed volumes.

The altar sits along one of the long walls of the building, and the window sits directly opposite the altar, across the smaller width of the room and approximately 2.4m up from ground level. Though 1.8m long and 0.6m high, the window does not read visually as a large area when in the room.

Due to its proximity to the altar, and especially as the priest turns repeatedly during the service to address the spirit of the congregation with the affirmation "Christ in You", it was felt that window should not be too loud, but be imagined as a response to the activities at the altar. At the altar, through the ritual process of the Offering, Transubstantiation and Communion, the soul forces of the human being are offered up, received, consecrated and then returned as healing medicine through the image of the bread, wine and water. As the altar represents the earthly side of "what is offered up", it was felt that the window could show the heavenly side, the macrocosmic communion.

Out of these concerns, the design for a window of six panels developed. The long horizontal space of the window was divided up into six more vertically orientated panels. From the start I was opting for a technique of fusing overlaid sheets of coloured glass into solid panels. By fusing layers of overlapping coloured glass there is the possibility for an expanded palette of colours with the creation of mid-tones or hues, while the need for leading is eliminated. I did experiment with making and fusing up glass frit into panels, but was unimpressed with the results. My experiments with overlaid colours seemed to hold more potential. These experimental panels (Fig.5) had a quite orthogonal aesthetic of

intersecting strips of colour that was quite reminiscent of weaving or textiles, which would suit the orthogonal language of the building.

Following the idea of the macrocosmic communion, the visual theme of the panels would be moments of crossing. The cross, here not used as the symbol of the crucifixion, but of those moments of the incarnation of the divine into the earthly world, where the transcendent vertical interpenetrates the temporal horizontal flow. During the Act of Consecration of Man the action of crossing is used in this way by the congregation during certain responses, and by the priest during the moment of the Transubstantiation, where three crosses are made over the wine and bread.

In the panels the motif of the cross occurs as a simple outline in the outer panels and becomes more complex and elaborated towards the middle panels. The centre two panels consist of a multitude of crossings, to represent the many moments of communion and consecration that weave together “in widths of space and in depths of time”<sup>4</sup> as the heavenly incarnates into the earthly world.

The colour scheme is based on my experience of Goethe’s Colour Theory. Goethe showed how colour could be considered as arising out of the interaction of light and dark. At the boundary of light and darkness, where darkness obscures the light, the warm colours arise, as when the light of the sun is seen through the hazy atmosphere, appearing darkened as yellow or red. Conversely where light illumines the dark, the cool colours arise, as with the blue sky, where the dark of space is seen through the space of the illumined atmosphere. Normally these two situations are shown where yellow bleeds over into the blue, creating green and the ordinary spectrum of our daylight consciousness. Goethe showed that another situation was also possible, where the red end of the warm scale meets the violet end of the

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<sup>4</sup> One of the poetic images from the Act of Consecration of Man.



cool scale giving birth to a vibrant magenta colour. This creates a spectrum that passes from yellow through orange and magenta to purple and blue, more akin to a macrocosmic night consciousness. I have used this dark spectrum as the framework for the colour fields in the window.

As well as Goethe's colour theory I kept in mind the image of the Risen Christ from Mathias Grunewald's *Isenheim Altarpiece*, surrounded by its colourful "Sun at midnight" aura, and a work on a similar theme by the Swiss painter Ninetta Sombart. Spencer Gore's *The Ickfield Way* and Roy de Maistre's *Rhythmic composition in yellow, green minor*, were also used as visual references for their strong colour harmonies. The musical work *Tabula Rasa* by Arvo Pärt provided a suitable mood to design by.

Much of the furniture of the chapel is in blond coloured woods, so in keeping with this interior it was felt that a window frame of Silver Ash would be appropriate. I will design and make the frame. I am hoping to set the panels back into the frame, and use bevelled beading that projects out beyond the framing to give depth and some sense of reveal to the frame. Like the bevelled framing of a Gothic stained glass window, I hope to bring a sense of depth to the wall plane.

Each panel consists of two layers of coloured glass pieces and a top layer of clear glass. Full-scale drawings of each panel were produced allowing me to map each layer and try and predict the effects of the overlapping glass sheets. I fused a test piece of the different overlapping colours to produce a palette of possible colours, and then used this to coordinate my choice of glasses in each panel. What followed was an involved and complicated sequence of cutting and assemblage. The finished design was not always apparent in the unfused panel, as some glasses only strike to their true colour when fired. This necessitated crossing my fingers and hoping the imagined panel would come out of the kiln. As it is, sometimes the design was subtler than expected, sometimes more

overpowering than expected. As Joseph Albers explains in his book *The Interaction Of Colour*, our apprehension of colours is influenced by their relative areas and relationships to surrounding colours. The full effect of the design could only really be seen in the finished panels. Fortunately, of the six panels, only one had to be adjusted and refused.

The window, entitled *Weaving in Widths of Space* (Fig.30), will be installed and unveiled at the chapel in Hackett on the 26<sup>th</sup> of April 2004, when the level of its success as a site- specific artwork can be truly judged.

## Closing Remarks

My year in the glass workshop has been incredibly varied, and the final works could have gone in a totally different direction to the ones produced. I feel the experiments I made and the ideas I had, but put aside, have the potential for many other bodies of work. It is always good when an ending has the seeds for many new beginnings.

Technically I have had to accrue many skills to accomplish the works produced, always building on my previous skills in architecture and wood. For example to produce the cast sculptural pieces required the development of skills in working with wax, making large plaster mother moulds and casting moulds, and the development of a broad range of approaches to cold working. The large forms were particularly taxing simply due to the, some would say, ridiculously large mother moulds and casting moulds they required.

I feel it is a successful result to have produced sculptural works over a range of scales, from the hand held object to a large sculptural work. I would like to continue in the future with some of the ideas that fell by the wayside — the idea of the metamorphosis between forms, and also further explore the impact of tonal variation within the form. The language of the interaction of light, form and glass is one that I am still in the process of learning. As stated previously, I would like to also explore other ways of prototyping forms besides direct wax modelling.

Given my continued interest in the possibilities of colour combining in fused glass, I am grateful that the opportunity arose to explore this on a large scale through the commission for a window by the Christian Community for their Chapel at Hackett. This is a type of work I would definitely like to continue making.

As someone who thinks of myself as primarily a designer I am still coming to terms with understanding what it means to produce art, and the appellation of artist. As there is a tension between the geometry of my architectural training and the organicism of my



Goethean studies, I believe the polarity of designer and artist will induce a similarly creative tension. In any case my work will continue to be informed by a strong spiritual undercurrent, whether that rises to the surface as geometric order or more organically inspired forms.

## Addenda

# Study Program

March 2003

Peter Stewart - Graduate Diploma (Glass)

## Proposal

I propose to begin the semester with a period of experimentation and exploration of the materiality and working of glass. The aim is to increase my sensitivity to the material and expand the extent of my experiences with working glass. These experiments will explore the effects of different types of fusing, the impact of cold working and the development of cold working skills. I will look at the interaction of different layers of colour and the effects of grinding back and polishing into these layers. I would also like to explore mosaic glass techniques. On the basis of these experiments I will evolve my further direction.

## Directions of Interest

- The two faces of glass - as an opaque coloured ceramic or as a translucent crystal with a relationship to the light.
- Vessels
  - Vessel as a surface canvas for decoration, narrative.
  - Vessel as a volume to be divided, interpenetrated.
- Architectural Glass - glass between you and the light.

## Personal Background Influences

- My architectural background gives me a predilection to geometry, proportion and architectonic images.
- My interest in the scientific work of Goethe, his Colour Theory and theory of plant and animal metamorphosis. It's primary gestures are creative polarity and *steigerung* or "enhancement" - the transformative process between the polarities.

## Artistic Context

- Early Glass - the early mosaic glass vessels and cast vessels of Alexandria.
- The glasswork of Carlo Scarpa, particularly the murine vessels, which have a strong graphic quality.
- Aboriginal dot paintings and bark paintings. Their use of a limited palette of colours, yet often to striking visual effect.
- The thick walled translucent cast vessels of Tessa Clegg.
- The cast works of Ivan Mares, particularly his use of glass thickness to vary colour and tone.



# Independent Work Proposal

Semester Two 2003

Peter Stewart

My work proposal for Semester Two falls into two parts. Firstly a series of cast sculptural pieces based around the idea of metamorphosis. Secondly a commissioned religious window panel probably using fusing techniques.

## **Metamorphic Series.**

### **Aim/Subject**

- a series of sculptural forms related through the concept of metamorphosis. Metamorphosis relates distinct and different forms by an underlying mobile archetype.
- the work is based on the concept of metamorphosis as proposed by Goethe in his scientific works, and developed by Rudolf Steiner. Another strand of the content of the works is related to the idea of communion, and the use of the circle form with its centre and periphery to represent the self/world tension. The point centred conscious of self in relation to the peripheral consciousness of the macrocosm.
- the series is based around three related forms.

### **Research**

- Goethe's *Theory of the Metamorphosis of Plants* and its continuation in the artistic forms of the first Goetheanum in Switzerland.
- the cast sculptural work of S. Libensky and J. Brychtova as examples of the interaction of glass thickness, colour and light.

### **Methods and Materials**

- lost wax casting based on repetitive wax moulds of basic forms. I hope to experiment with the basic form by modulating the thickness of the piece in different ways to change the density of colour in relation to the form.

### **Timeframe**

- I have already started investigating three related forms. I have produced simple models in MDF and have started making repetitive silicon rubber moulds of these.
- the next step is to experiment with altering the thickness of the wax positive, then to produce some trial casts to establish the connection between the form, thickness and tonal emphasis.
- the next step would be to refine the forms, and explore issues of scale.

## Religious Window Panel

### Aim/Subject

- a religious window that uses a non-traditional technique such as fusing or casting.
- the subject of the piece is yet to be decided but may be related to a particular moment in the cycle of the religious year such as the Easter Holy Week. It is intended that the piece express a mood and not necessarily a pictorial image.
- the piece is to cover one window but may be comprised of several panels.

### Research

- the work is site specific and related to a room with ritual usage. At the same time the work needs to be able to be removed and relocated if required.
- the theme can be developed out of the imagery of the Act of Consecration of Man and the cycle of year. Much of the religious imagery connected to the Christian festivals in the Northern Hemisphere relies on a strong connection to the seasons. ie. Christmas occurring in the depths of winter is conceived of as the “birth of the light in the darkness”, similarly Easter, a festival of death and resurrection, coincides with the turning of the Spring tide in nature. In the Southern Hemisphere there is a different experience and the possibility for a different symbolic conception/expression.
- the writings of Emil Bock (*The Three Years*), Rudolf Steiner (*The Festivals and Their Meaning*), and Georg Kuhlewind on the Prologue to the Gospel of St John (*Becoming Aware of the Logos*).
- relevant artistic precedents, covering a range of technical approaches to architectural glass, include the cast sculptural panels of S. Libensky and J. Brychtova, the fused architectural panels of Dorothy Hafner, and the deep engraved windows of the second Goetheanum by Assia Turgenieff.

### Materials and Methods

- my preference is to use a series of fused panels to make up the window, but this is to be decided in consultation with the client. Fusing offers possibilities of colour mixing by overlaying different coloured glasses, which could be effective in this context. As most of the work occurs during the composition of the piece before fusing, and since cold working is kept to a minimum after fusing, I think fusing offers an efficient technique in terms of time and money in this instance.

# Curriculum Vitae

Born 1971, Sydney, Australia.

## Education

2003	Candidate for Master of Visual Arts, ANU School of Art
2001 – 2002	Diploma of Visual Arts (Wood) ANU School of Art
1989 – 1991	Bachelor of Science (Architecture) Faculty of Architecture University of Sydney

## Group Exhibitions

2004	<i>Horizons</i> , Visual Arts Graduate Season, ANU School of Art Gallery and Foyer Gallery.
2002	<i>GO2</i> , Wood Workshop, ANU School of Art. <i>Freshly Squeezed</i> , Graduate exhibition, ANU School of Art Gallery. <i>Seat of Power</i> , Old Parliament House, Canberra. <i>Group Exhibition of Chairs</i> , Old parliament House, Canberra.

## Commissions

2003	<i>Weaving in Widths of Space</i> , Church Window Commission, The Christian Community, Hackett, ACT. <i>Writing Desk</i> , Private Commission, ACT.
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## Competitions

2002	<i>Seat of Power</i> , Finalist entry with Julie Kennet, Old Parliament House.
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